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厦门大学

硕士学位论文

绿色发展：海港可持续发展实践研究

Growing Green: Sustainable Practices at the Seaports

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摘 要

随着公众环保意识的增强，海运港口目前都面临其发展的新目标和新任务。剧烈的气候变化和严重的污染，无法用一套“速战速决”的措施来处理，而在港口重建和经营的过程中需要一种新的方法。同时，经济增长也不能被忽视，这就要求在港口管理上采用一种

既考虑经济利益也考虑可持续发展的综合方式。需要找到一个新的增长模式：能够更好地满足经济发展的需要，也能确保环境质量，使气候更加可持续。这是经济与合作发展组织（OECD）最近在其发布的报告“绿色战略综合报告：迈向绿色增长”中传递的主要信息。铭记后代人的的生活保障和福祉需求，绿色港口的概念现在在许多国家成为治理项目的一部分开始在地方得到落实。这其中一个重要的做法是通过国际和国内立法采用严格的规范和许可制度来综合应对上述问题。

本论文研究的目的在于满足现有对绿色港口可持续发展实践进行比较研究的需要。论文首先进行了文献回顾与概念分析。论文选取了来自北美洲、大洋洲和欧洲的三个港口进行案例研究，这三个港口分别是洛杉矶的长滩港、澳大利亚的悉尼港和荷兰的鹿特丹港，由于其近年来巨大的货物吞吐量以及成功实施可持续发展的实践。对这三个港口案例进行研究的目的在于总结其管理的成功经验，以为中国福建省的厦门港（它将作为第四个案例）的管理和经营计划改进提供实用的建议。本论文的案例研究也将促进对不同地域的主要港口开展的国际化比较研究。

关键词：绿色港口；可持续发展；经济利益；空气污染；水污染；土壤污；未来的发展

Abstract

With the increasing environmental awareness of public, maritime ports are now facing new goals and tasks in their development. Dramatic climate change and enormous levels of pollution cannot be treated with a set of ‘quick-fix’ measures; instead a new approach is needed in ports restructuring and operation. At the same time the economic growth cannot be under-looked, which calls for implementation of a merged approach of ports existence including both economic benefits and sustainable growth. A new growth paradigm is required: one that better fulfills economical needs and ensures environmental quality and makes climate more sustainable. This is the main message of a recent call made by the OECD in its ‘Green Strategy Synthesis Report: Towards Green Growth’ (www.oecd.org). Bearing in mind safeguard living and well-being of future generations, the concept of a Green Port is now step-by-step taking place as local initiatives and part of governmental programs in many countries, with international and national legislation incorporating these issues through strict regulations and system of permits.

This study aims to fulfill the existing need for formulating the comparative framework in green port sustainable practices. The research objective is firstly achieved by literature review and conceptual analysis. Three case study ports were chosen from North America, Oceania and Europe, namely Long Beach/Los Angeles, Sydney Port, Rotterdam Port, due to their high volume traffic and cargo volume handled as well as successful implementation of sustainable practices in recent years. These three case studies are presented with the aim to relate the successful practices and industry actions, to make a prospective practical suggestion plan of actions applicable to Port of Xiamen, Fujian province, China (which will be presented as the forth case study scenario) and research implications will be discussed. The case studies add value to the international perspective from the major ports from different geographical points.

Key Words: Green port, sustainable development, economic benefits, air pollution, water pollution, land pollution, future developments

Chapter 1. Introduction

1.1 *Introduction*

Seaports are known to be not only historic and commercial infrastructures in the logistics chains and transportation that are essential to national and regional economies' well-being, but are also centers of environmental pollution, originating from ship movements and ports' activities, as well as land-based activities. This brings an eventual recognition, that economic growth in ports must be balanced with environmental protection and social progress. This has led to the growing attention of the need for sustainable development in ports.

Plentiful researches has been done on port environmental practices in European and American ports, providing various information about actions taken, but there is limited data on sustainable port practices from different parts of the world. Case analysis of sustainable port development practices' is still limited. Given the gap, this paper aims to present a broad research and study on number of ports around the world, presenting the findings from ports practicing sustainable developments, what kind of action has been taken and challenges faced with the aim to use the mentioned experience to apply to the International Xiamen Port, Fujian province, China.

Other than reasons of environmental legislation enforcement, ports' enterprises start to make their business choices based on the needs of sustainability and turn it into the possible market value. Recent surveys showed that around 82% of businesses are eager to spend more on environmental programs (EnvLeader, 2009), since the enterprises see the chance to charge higher price due to the greener image. Those who manage to turn sustainability as their source of competitive advantage will eventually win in the new competitive field (Etsy & Winston, 2006). As such, ports sustainable development is to tie the economic benefits with greener approaches is seen to be quite desirable. The literature to date has yet to fulfill the much desired demand.

1.2 *Ports' Functions*

Human population is growing drastically, bringing on the patterns of human settlement to that of filling the coastal zones first of all, so population tend to increase the fastest in the future exactly at these areas (Chua and Ross, 1998). International seaborne trade is flourishing, being the backbone to many economies, thus ports are being of vital importance to every country having a sea line. Over 80 percent of all goods are being transported by

ships. From computers to clothes, food to crude oil, shipping is essential to the global economy (The World Bank Group, 2003). By the end of 2005, world seaborne trade (goods loaded) had reached 7.11 billion tons, total maritime activities (measured in ton-miles) increased to 29,045 billion ton-miles (United Nations Conference on Trade and Development (UNCTAD), 2006).

Ports are no longer simple hubs with central goal is handling cargo, they have turned into a complex system, fulfilling not only goods delivering and distribution functions, but becoming more of an all-inclusive logistics center and information center, as well as passenger advisory centre. All these eventual developments cause ports to play equally import role at the country level, as well as an international level trade and economy-building participants.

Globalization causes plentiful countries around the globe to join in the water transportation development trend. Owing to comparatively energy-saving indexes and environmentally friendly ways of transportation along with requiring less operational area, while handling huge volumes along with the acceleration of integration, many countries around the world have a growing dependency on water transportation. Compared to highway and air transportation, water transportation is a relatively energy-saving and environmentally friendly way of transporting many goods. It has advantages, such as requiring less operational land area, causing less pollution, and handling large-volumes of cargo. The European Union plans to vigorously develop water as a strategy for achieving sustainable development (Zhuan Xiao and Genfa Lu, 2002).

The Chinese government is also aware that the ‘vigorous development of water transportation is the key to achieve sustainable development of transportation. Also, it is a positive step to reach resource-saving and environment-friendly society’ (Ministry of Transportation, 2006, 28(4): 22-25). So this principle is being vigorously applied to the port of Xiamen, China.

However, coastal zones are particularly sensitive regions, and coastal ecosystems often are very fragile. The speeding development of waterways in promoting sustainable development of transportation could potentially lead to negative environmental impacts on ports and the waters surrounding around ports.